Patent claims

1. A controlled deflection roll having a rotatable roll shell which is penetrated by a stationary shaft, a hydraulic bearing arrangement between shaft and roll shell, which is formed by individual hydrostatic bearing elements arranged axially beside one another, which each comprise a radially movable force element having an outer bearing pocket element, the outer bearing pocket element having a cylindrical outer bearing surface supporting the cylindrical roll shell hydrostatically on an inner shell circumferential line, and having an edge bearing unit provided at each end of the roll shell, the outer bearing pocket element (9) in each case being mounted hydrostatically on a spherical inner bearing surface (13) running concentrically with respect to the inner circumferential line of the roll shell (2).

2. The controlled deflection roll as claimed in claim 1, the hydrostatic bearing elements (7) in each case having an inner hydrostatic supporting element (12), on which the inner bearing surface (13) is formed.

3. The controlled deflection roll as claimed in claim 1 or 2, the force element being formed as a pressure piston, which is guided such that it can be moved radially in a recess (41) in the shaft (1).

4. The controlled deflection roll as claimed in one of claims 1 to 3, the inner bearing surface (13) being assigned an inner bearing pocket element (14).

5. The controlled deflection roll as claimed in one of claims 1 to 4, the outer bearing pocket element (9) being formed by an outer hydrostatic supporting element (8), which accommodates an inner bearing pocket element (14) while forming an inner bearing edge surface (15).

6. The controlled deflection roll as claimed in one of claims 1 to 4, the spherical inner bearing surface (13) being provided on an inner supporting element (12) of a force element (70).

7. The controlled deflection roll as claimed in one of claims 1 to 6, the inner bearing surface (13) consisting of individual surface sections.

8. The controlled deflection roll as claimed in one of claims 1 to 7, the hydrostatic bearing elements (7) each being connected to a feed line (17, 19) for a pressure fluid for feeding bearing pocket elements (9, 14).

9. The controlled deflection roll as claimed in claim the 8, the feed lines (17, 19) for the pressure fluid each being connected to a control unit which determines the pressure and the flow of the pressure fluid.

10. The controlled deflection roll as claimed in claim 8 or 9, it being possible for outer and inner bearing pocket elements (9, 14) to be pressurized with a constant volume flow of a pressure fluid in each case.

11. The controlled deflection roll as claimed in one of claims 1 to 10, the edge bearing unit (6) at the end of the roll shell being formed by an antifriction bearing arranged on a radially movable bearing ring in each case.

12. The controlled deflection roll as claimed in one of claims 1 to 10, the edge bearing unit (6) at the end of the roll shell being formed by at least two hydraulic bearings (6.2) arranged distributed in the circumferential direction on a radially movable bearing ring (6.1), which are formed in the same way as the hydrostatic bearing elements (7).

13. The controlled deflection roll as claimed in one of claims 1 to 12, the hydrostatic bearing elements (7) being arranged along opposite rows between the two edge bearing units (6).

14. The controlled deflection roll as claimed in one of claims 1 to 13, it being possible for a heating medium to be fed into an annular space (3) between roll shell (2) and shaft (1).

15. The controlled deflection roll as claimed in one of claims 1 to 14, the roll shell (2) having an outer resilient cover.

16. The controlled deflection roll as claimed in one of claims 1 to 15, the outer hydrostatic supporting element (8) in each case being assigned a sealing gap maintaining apparatus, which comprises a hydrostatic mounting element with an independent pressure medium supply (56).

17. The controlled deflection roll as claimed in claim 16, the hydrostatic bearing element being formed outside the outer bearing edge surface (11) on the outer hydrostatic supporting element (8) and comprising at least three bearing pockets (52) arranged distributed circumferentially and fed jointly via connected pressure lines (54).

18. The controlled deflection roll as claimed in claim 16 or 17, the hydrostatic bearing element having a plurality of bearing pockets (52) arranged at a distance from one another and bounded by an annularsurface (53) in each case.